

## Status, Prospects for Aquaculture in Nigeria

### Background

Production from aquaculture is less than 10 percent of the country's total annual domestic fish production of 700,000 tons. However, there is a great potential for large-scale production; some 1 million ha of swampland are available in Nigeria's delta area for brackishwater culture.

The country's Third Development Plan 1975-1980 earmarked N\$10 million for aquaculture development and research. This sum is about 10 percent of the total capital outlay for fisheries development and research during the Plan period. The program involves the stocking of irrigation dams and reservoirs as well as the construction of modern fish farms.

Construction of ponds is labor-intensive. Invariably, fishpond farming is a part-time operation. However, some half a million people are estimated to be engaged in some phase of aquaculture or the other.

### Manpower

The main problem in Nigeria's aquaculture development is not land, labor or capital but technical skill. In some states, the extension staff of government experimental and demonstration farms are well-trained and could carry out surveys and supervision of pond construction and management.

### Facilities

Nigeria has the following types of aquaculture installations: (1) hatcheries and breeding centers for raising fish seed for government production farms and private ponds (2) pond farms whose sizes range from 0.5 ha to 400 ha (3) man-made lakes and reservoirs (4) cages, which are purely for research purposes (5) indoor tanks, also for research purposes particularly in the study of *Clarias*, *Tilapia* and *Chrysichthys* and (6) oyster and mussel farms.

## Prospects for Aquaculture Development in Brazil

### Background

By 1985, the population of Brazil is projected to reach 142 million (108 m in 1974). Per capita fish consumption is 7.1 kg. In 1974, Brazil's fish production was 861,700 tons 13 percent of which comes from freshwater aquaculture. Brazil is a traditional exporter of crustaceans, principally prawn and lobster, and the "Piramatuba" fish species of the Amazon region. It also imports a substantial amount of dried and salted fish (24,600 tons in 1974).

By 1985, assuming that per capita fish consumption is maintained, Brazil would be needing some 1 million tons of fish. For 1985, it is estimated that the marine fishery production will go up to 400,000 tons. The deficit is expected to be filled up through aquaculture production.

### National Fishery Plan

Brazil's Bureau of Fisheries Development, which is attached to the Ministry of Agriculture, has formulated a 1975-1979 national plan for fishery development which seeks to implement programs and projects designed to improve production at different levels through an integrated scheme of (a) research on fishery resources (b) manpower training (c) development of improved fishponds (d) strengthening of commercial fishing (e) development of fish ports (f) improvement of fishery laws, and (g) development of an effective fishery administration.

The Plan's long-term strategy is to establish aquaculture as a substantial source of animal protein at all levels in rural and urban areas.

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## Filipino Aquaculturist Goes into Egg Production of Brine Shrimp

Brine shrimp, an essential feed for prawn larvae and milkfish fry is now being grown successfully by a private commercial fishpond operator, Atty. Ceferino de los Santos, Jr. of Iloilo Province.

Atty. de los Santos who is the author of *Modern Aquaculture for the Philippines*, an authoritative book written for the ordinary fish farmer, claimed

he was able to evolve the technique for producing viable eggs of the San Francisco strain of *Artemia salina* with technical expertise provided by two SEAFDEC Aquaculture Department visiting scientists from the University of Ghent in Belgium, Dr. Patrick Sorgeloos and Mr. Etienne Bossuyt, and a Filipino researcher, Einstein Laviña.

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Atty. Ceferino de los Santos inspects one of his *Artemia salina* grow-out ponds.



## India... (from page 6)

The project has recently completed the first phase of three years and demonstrated the feasibility of the technology in obtaining high fish yields in rural areas in the States of West Bengal and Orissa.

Technology in freshwater aquaculture in India has been generated, but unfortunately technology packaging and dissemination has been very slow and is yet to reach the farmers' level throughout India. The recent establishment of a *Krishi Vignan Kendra* and Trainer's Training Center at Dhauli (CIFRI) by ICAR and further intensification of the activities of the Extension wing of CIFRI would no doubt help in quicker transfer of the improved technologies generated at the Institute for the benefit of the end-users, thereby increasing the production of freshwater fish in the country.

## China... (from page 4)

high protein foods are the most important factors in the success of this technique in China. It was also noted that bulk harvesting of stocks leaves time for other activities than fish catching. In China, it is the fisherman who usually produces the fish to be stocked.

In large lakes, harvesting is by conventional ways. But in smaller lakes and new reservoirs, quick large scale harvesting is done usually with seine nets up to 5 km long. Encircling nets and seine 1 to 1.5 km long are regularly used. Most of the work is manual.

The Chinese practice is to raise 15 or more pigs per hectare of water to provide manure to stimulate plankton growth. Green grass and vegetables are fed to grass carp which in turn produce fish manure and food for other fishes. "Feed one grass carp well and you feed three other fishes," the Chinese say.

### Some Lessons

The FAO Mission pointed out that it is necessary to look at China's program of stocking, fertilizing, and fishing all available waters in the context of her emphasis on agriculture as the key to development and of the whole program of agricultural production that reflects the policy.

Cost-benefit ratio appear to be evaluated in terms of overall development rather than on an individual basis, it was stressed.

## Brazil... (from page 5)

### Development Activities

A priority move is to stock reservoirs and dams which today comprise some 2 million hectares. Brazil has launched a program of restocking in the different regional river basins by the industries responsible for the dams. The reservoirs are expected to produce about 700,000 tons by 1985.

Researches done at the Biology and Fish Culture Experimental Station in Pirassununga, Sao Paulo, on *Tilapia rendalli* confined in 14 sq m netted tanks and fed with a mixture of 60 percent chicken dung, 15 percent granulated feeds for laying birds, 15 percent ground maize, and 10 percent soybean made possible the production of 19.9 kg per sq m per year.

### Research Priorities

Fisheries and related research in Brazil is undertaken or supported by 41 government institutions. The projects involve basic researches, development-oriented studies on fish culture, information-extension, and stocking of public reservoirs. Short term priorities include limnological studies, culture methods and economic studies, water potential for aquaculture, fertilization and feeding, pathological and pollution studies. The long term studies are those on the selection of indigenous and tropical species for aquaculture and breeding for aquaculture purposes, fish preservation, and by-products utilization.

### Extension

There are no information and extension services specifically for aquaculture owing to the lack of basic information on aquaculture. Collating information is one of the immediate objectives of the present development plan.

### Manpower Training

The manpower program is immediately aimed at producing technicians, on the supervisory level, for programs in regional basic researches and for information and extension.

### Financing and Credit

The national fishery development plan provides a system of protection for aquaculture in the form of general fiscal incentives and bank credits for

approved programs in which the Bank of Brazil, the Central Bank, the BNDE, and SUDEPE participate. The information campaign also includes educational programs on production planning and aquaculture techniques along with the application for and proper use of the loan.

### Infrastructures

The aquaculture development plan provides for the establishment of 14 hydrobiological and fish culture stations with a total estimated cost of US \$16.8 million. Operational cost of one station was placed at US \$40,000 a year.

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## Filipino Aquaculturist..

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According to De los Santos who is president of the Western Visayas Federation of Fishfarm Producers, Inc. and member of the Fishery Industry Development Council representing inland fisheries/private sector, his interest in growing brine shrimp and producing eggs stemmed from a laboratory trial along these lines conducted early this year by the SEAFDEC researchers.

De los Santos announced he is ready to commercially sell canned highly viable (90 percent hatching rate) Artemia eggs at 30 percent less than the prevailing price. He revealed that current cost of importing eggs of brine shrimp is about US \$75 per kg, tax free. In the local market, it is being distributed for about P785 for a 1.3 kg pack or around P603 a kilo. He is also ready to sell Artemia flakes for fish food.

The significance of this development lies in the tremendous reduction in cost of growing brine shrimp as feed and in the assurance of an important low-cost input to prawn hatchery operations, fry nursery ponds and aquaria fish food.

Meanwhile, De los Santos has been invited to present a paper on his work on the brine shrimp before the World Symposium on *Artemia salina* to be held at Corpus Christi, Texas, U.S.A. next year.